

The Effect of Telephone Social Support and Education on Adaptation to Breast Cancer During the Year Following Diagnosis

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Purpose/Objectives: To find the most effective methods of providing social support for women diagnosed with breast cancer by testing the effectiveness of a telephone social support and education intervention to promote emotional and interpersonal adaptation to breast cancer.

Design: Multisite, two-group experimental study with repeated measures.

Setting: Arkansas and New Jersey.

Sample: The Arkansas sample consisted of 106 women who entered the study two to four weeks postsurgery for nonmetastatic breast cancer and were randomly assigned to an experimental or control group. The comparison group consisted of 91 women from New Jersey who had participated in a previously completed study that used the same interventions and found that telephone support resulted in more positive, statistically significant adaptation to the disease.

Methods: The experimental group received 13 months of telephone social support and education. Both groups received educational materials via a mailed resource kit. The Profile of Mood States; Visual Analogue Scale–Worry; Relationship Change Scale; University of California, Los Angeles, Loneliness Scale–Version 3; and the modified Symptom Distress Scale provided data regarding the variables of interest. Data analysis included descriptive statistics, t tests, and multivariate analysis of variance with repeated measures.

Main Research Variables: Mood, worry, relationships with significant others, loneliness, and symptoms.

Findings: Data analysis showed no significant differences between groups, and both improved on some of the outcomes. Significant time-by-location interaction effects were found when comparing the Arkansas and New Jersey samples, thereby supporting the need to consider regional differences when developing interventions.

Conclusions: The mailed educational resource kit alone appeared to be as effective as the telephone social support provided by oncology nurses in conjunction with the mailed resource kit.

Implications for Nursing: Mailed educational resource kits may be the most efficient and cost-effective way to provide educational support to newly diagnosed patients with breast cancer, but their effect may differ according to region.

Women with breast cancer may experience emotional distress and mood disturbances, such as anxiety, confusion, and depression (Longman, Braden, & Mishel, 1999; Ward, Viergutz, Tormey, deMuth, & Paulen, 1992); worry about the recurrence of breast cancer (Blume, 1993; Brandt, 1996); a decreased sense of well-being (Kahn & Steeves, 1993); and difficulty maintaining established relationships with significant others, resulting in feelings of loneliness (Knobf, 1986; Wolberg, Romsaas, Tanner, & Malec, 1989).

Key Points . . .

- ▶ The most effective and time efficient methods of providing social support for women with breast cancer need to be determined.
- ▶ This multisite experimental study tested the effectiveness of telephone social support and mailed educational resource kits for women with breast cancer.
- ▶ Researchers found that the mailed resource kit alone was as beneficial as the telephone social support coupled with mailed education in helping women in Arkansas with mood disturbance, cancer-related worry, symptom distress, and relationships with significant others, which was in contrast to the sample in New Jersey, for whom telephone support and education were more effective.

Since the 1980s, social support has been advocated for women diagnosed with breast cancer (Blume; Pillon & Joannides, 1991; Sparks, 1988). Social support is an interaction between two or more people with the purpose of promoting education and awareness, assisting with problem solving, and providing emotional support (Sandgren, McCaul, King, O'Donnell, & Foreman, 2000). Supportive care has become the standard in

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oncology. Finding the most effective methods of providing this care is the challenge. The American Cancer Society Reach to Recovery program (Ashbury, Cameron, Mercer, Fitch, & Nielsen, 1998), the Cancer Information Service of the National Cancer Institute (Ward, Baum, Ter Maat, Thomsen, & Maibach, 1998), and cancer support groups (Rice & Szopa, 1988; Samarel et al., 1998; Samarel & Fawcett, 1992) have been the most frequently used interventions. More recently, telephone social support and education have been considered as methods to help women adapt to breast cancer (Samarel, Tulman, & Fawcett, 2002; Sandgren et al.).

This experimental study tested the effectiveness of a telephone social support and education intervention to promote emotional and interpersonal adaptation to breast cancer. The study design and selection of outcome variables were guided by the Roy Adaptation Model of Nursing (Roy & Andrews, 1991), the investigators' previous research (Samarel et al., 2002), and the research literature.

Conceptual Framework

The Roy Adaptation Model of Nursing (Roy & Andrews, 1991) depicts people as biopsychosocial beings who are required to adapt to environmental stimuli. Environmental stimuli are categorized as focal (i.e., the stimuli most immediately confronting a person), contextual (i.e., contributing factors in the situation), or residual (i.e., other unknown factors that may influence the situation). When the factors that compose residual stimuli become known, they usually are considered contextual stimuli but also may be focal stimuli. Roy and Andrews postulated that interventions influence adaptation by increasing, decreasing, maintaining, removing, or otherwise altering relevant focal or contextual stimuli. For the purposes of this proposed study, the experimental and control treatments represent varying degrees of increase in the focal stimuli of social support and education. Contextual stimuli are represented in this study by demographic and cancer treatment variables.

Adaptation takes place in four response modes: self-concept, interdependence, role function, or psychological. The self-concept mode is an individual's notion of his or her physical and personal self, with an emphasis on emotional responses. The interdependence mode focuses on interpersonal relationships and emphasizes the development and maintenance of satisfying, affectional relationships with significant others and the provision and receipt of social support. The role function mode is concerned with the performance of role activities based on a person's position within society. The physiological mode encompasses the basic needs required to maintain physical and physiologic integrity.

Background

In a randomized clinical trial conducted in New Jersey, investigators tested the effects of three types of social support and education delivered by oncology nurses and social workers: combined telephone and in-person group support and a one-time mailing of an educational resource kit ($n = 34$), telephone social support coupled with the mailed educational resource kit ($n = 48$), and the mailed educational resource kit alone ($n = 43$). The study examined outcome variables that represented two of Roy's four response modes of adaptation to environ-

mental stimuli: self-concept and interdependence. Cancer-related worry, well-being, and mood disturbance represented the self-concept mode, and subjects' relationships with significant others determined their levels of interdependence (Samarel et al., 2002). Participants in groups that received social support and education reported less mood disturbance and loneliness and higher-quality relationships with significant others at some phases of the study than those who received only mailed educational information ($p < 0.01$). No significant differences were found between participants who received telephone and in-person social support and education and those who received only telephone social support and education. These findings suggested that telephone support could provide an effective alternative to in-person support groups. However, this study was limited to one region of the country and the researchers could not determine whether the intervention would be effective elsewhere. In addition, few African American women participated in this study; therefore, the intervention's effectiveness across different racial groups could not be determined. Data from participants in New Jersey who received only telephone social support and the one-time mailing of an educational resource kit ($n = 48$) and those who received only an educational resource kit ($n = 43$) were compared with data from the Arkansas sample.

Hypotheses

This study tested three hypotheses: (a) The group receiving the experimental treatment (i.e., 13 months of ongoing telephone social support and education using a one-time mailing of a resource kit) would have less mood disturbance, cancer-related worry, and symptom distress; better well-being; and higher-quality relationships with significant others compared with the control group receiving education via a one-time mailing of a resource kit; (b) African American and Caucasian women in Arkansas would have similar responses to the intervention; and (c) women from Arkansas and New Jersey would have similar responses to the intervention.

Methods

Sample

Consistent with the sampling criteria for the study conducted in New Jersey, the sample in Arkansas was limited to English-speaking women diagnosed with tumor, nodes, metastasis (TNM) stage 0, I, II, or III (nonmetastatic) breast cancer who had no major underlying medical problems (e.g., cardiac or renal disease) or previous history of cancer (with the exception of nonmelanoma skin cancer) and who entered the study two to four weeks postsurgery. Women were recruited by referral from the Arkansas Division of the American Cancer Society's Reach to Recovery program and from hospitals in urban and rural communities. Oversampling of African American women was planned for the Arkansas site to ensure a sufficient sample size for testing the effect of the intervention on the two ethnic groups. Efforts to accrue African American women with breast cancer included recruiting, with support from an African American surgeon and clinical nurse specialist, at a hospital that primarily serves this population. Allowing for a 10% attrition rate based on the study in New Jersey, an enrollment of 110 was planned for the Arkansas arm. Fifty subjects per treatment group per site would provide a sufficient sample size for a power of at least

0.80 given an alpha of 0.05 with an estimated effect size of 0.08 (i.e., medium effect size) based on results from the New Jersey site. Once potential subjects were identified, the investigators sent each woman an invitation letter and telephoned her to explain the study. Before randomization to study groups, all participants signed consent forms provided by mail. The institutional review boards of the participating hospitals and the performance sites of the University of Arkansas for Medical Sciences in Little Rock and William Paterson University in Wayne, NJ, approved the study.

Data Collection

Research assistants obtained written informed consent by mail. Following baseline data collection, women were randomly assigned to treatment groups using a sealed opaque envelope technique. Data were collected by mail at five different times: entry into the study (i.e., two to four weeks postsurgery) and at the end of phases I (i.e., three months postsurgery), II (i.e., five months postsurgery), III (i.e., eight months postsurgery), and IV (i.e., 13 months postsurgery). Before each set of questionnaires was mailed, a research assistant, blinded to study design, contacted subjects by telephone to alert them to the forthcoming packet of questionnaires and request their continued participation in the study. No social support or educational information was provided during this telephone contact.

Experimental and Control Treatments

The 13 months of telephone social support and education delivered by oncology nurses were designed to provide more intense support during times of peak need as identified by women with breast cancer (Samarel & Fawcett, 1992). Therefore, phase I of the experimental treatment provided intense weekly telephone social support to each subject in the early months following surgery; phase II maintained that intensity of support for the next eight weeks and added a formal education component regarding adaptation to diagnosis and treatment (i.e., mailed resource kit); during phase III, telephone social support was decreased to twice per month as treatment continued; and telephone social support was decreased further during phase IV to once per month as women completed treatment and approached and passed the one-year anniversary of their diagnoses.

Eight weeks into the study, or about three months after surgery, women in the control group received the same mailed resource kit as the women in the experimental group but did not receive any other intervention. The mailed resource kit contained a specially designed information manual and supplementary materials, including audiotapes, videotapes, and selected pamphlets. The manual, written at an eighth-grade reading level, consisted of a narrative that included specific information that reflected the self-concept and interdependence Roy Adaptation Model response modes, special exercises or practice activities to enhance learning, and lists of relevant books containing additional resources. The content was arranged into eight chapters; one chapter was discussed during each of the eight weekly telephone calls with participants during phase II of the study (Samarel et al., 2002).

For consistency and standardization during discussion of this manual, the oncology nurses who provided the telephone social support participated in a training session and used an additional manual developed by the investigators. Each chapter in the

nurses' manual matched a chapter in the participants' manual and listed chapter objectives, suggested reading about the chapter topics, and supplementary materials mailed to the women. Experts in cancer, cancer education, or support groups reviewed the information to establish content validity and appropriateness of the order of presentation. Each oncology nurse maintained a log of all telephone contact with each woman. During each of the telephone calls during phase II, the oncology nurses focused on the manual content for the corresponding chapter, followed up on women's previous questions or concerns, and responded to new ones. Nurses maintained flexibility with content; topics were omitted when subjects did not need to discuss them. For example, if a woman was not receiving chemotherapy, concerns about nausea and vomiting related to chemotherapy were not discussed.

Women in the control group were informed that they could contact the project study office via a toll-free telephone number to speak to an oncology nurse if they had questions about the resource kit content. Logs were maintained of all telephone calls and only documented educational information related to the content of the mailed educational resource kit. Different oncology nurses interacted with the women in the control and experimental groups. Table 1 outlines the role of the oncology nurses in providing telephone social support and incorporating the mailed resource kit.

Outcome Measures

The instruments for measuring outcomes were selected on the basis of their logical congruence with the Roy Adaptation Model (Roy & Andrews, 1991) response modes, their appropriateness as outcome measures for the effectiveness of the experimental treatment, their psychometric properties, and the time required to complete the entire questionnaire package, with preference given to fewer and shorter instruments that would take less time to complete.

The **Profile of Mood States (POMS)** (McNair, Lorr, & Droppleman, 1971) calculates mood and is one of the most accepted and frequently used measures of affective mood state, or total mood disturbance (TMD). The POMS is a 65-item standardized questionnaire consisting of six subscales: Tension-Anxiety, Depression-Dejection, Anger-Hostility, Vigor-Activity, Fatigue-Inertia, and Confusion-Bewilderment. Each item is rated on a five-point Likert scale ranging from 0 (not at all) to 4 (extremely). Subjects select the number corresponding to their experience for each mood during the previous week. The score for each subscale is obtained by summing the responses. Ten of the 65 items are worded positively and weighted negatively to calculate subscale and TMD scores. TMD is the sum of the six subscale scores, a value that can range from -32 (best) to +232 (worst). The POMS has been used widely to assess the moods of patients with cancer and changes following interventions (Taylor, Lichtman, & Wood, 1984) as well as measure mood disturbance in women with breast cancer (Spiegel, Bloom, & Yalom, 1981; Taylor et al., 1984, 1985). Reliability and validity of the POMS are well established (McNair et al.), with reported internal consistency reliabilities ($K-R_{20}$) of the six subscales ranging from 0.84–0.95 in a sample of 1,000 psychiatric outpatients. Evidence of construct validity can be established by factor analysis, with items loading on the appropriate factor (McNair et al.), and from convergent validation procedures of correlations between the POMS and other related instruments (Sutherland, Lockwood, & Cunningham, 1989). The alpha

Table 1. Telephone Support Guide and Corresponding Roy Adaptation Model Response Modes

Phase: Duration and Contact	Oncology Nurse's Role	Response Mode
I: Weekly contact from two to three weeks postsurgery through three months	Informed subject of project format. Encouraged her to initiate contact.	Self-concept
	Provided opportunity for subject to discuss her experiences with diagnosis and treatment and her related feelings.	Self-concept, interdependence
	Provided information about treatment options and choices but did not give advice regarding treatment decisions. Referred patient back to her physician when appropriate.	Self-concept, interdependence
	Provided positive reinforcement for choices made.	Self-concept
II: Weekly contact through five months postsurgery	Explored the relationship between cancer and stress. Examined anxiety and insomnia in relation to stress caused by breast cancer diagnosis and treatment. Discussed stress management exercises such as relaxation. Discussed the importance of breast self-examination (BSE) and encouraged the subject to view the BSE videotape provided in the resource kit.	Self-concept
	Encouraged the subject to practice the relaxation and visualization exercise. Explored the need for effective communication with significant others and with healthcare team members. Introduced techniques, such as active listening, to enhance effective communication.	Self-concept, interdependence
	Emphasized the application of strategies and techniques to specific challenges being experienced. Discussed nausea and anorexia as common problems associated with treatment and strategies for coping with them.	Self-concept, interdependence
	Discussed fatigue and discomfort as common problems associated with treatment and suggested strategies to deal with them. Placed particular emphasis on mobility and comfort difficulties related to the sequelae of breast surgery as well as balance between activity and rest to promote "feeling good." Encouraged subject to view the exercise videotape provided in the resource kit. Began to explore the effects of cancer on self-image.	Self-concept, interdependence
	Encouraged the subject to view the videotape on cancer and self-image provided in the resource kit. Explored the effect of self-image on interpersonal relationships and reviewed specific strategies to improve self-image. Explored sexuality as a broad concept, as well as specific sexual issues.	Self-concept, interdependence
	Discussed the importance of understanding emotions and needs. Encouraged the subject to view the videotape on fear of recurrence.	Self-concept, interdependence
	Emphasized using community resources in the development of a personalized plan.	Self-concept, interdependence
III: Weekly contact through eight months postsurgery	Stressed the importance of regular BSE, mammography, and physician examinations. Followed up with previous issues, including sexuality, self-image, and fear.	Self-concept
	Encouraged the continued use of stress management strategies and effective communication techniques. Explored difficulties the subject may have experienced in their use and helped the subject notice changes in interpersonal dynamics as a result of their use.	Self-concept, interdependence
	Allowed the subject to verbalize concerns about termination of adjuvant therapy, provided reassurance that her feelings were normal, and continued to encourage questions.	Self-concept
IV: Weekly contact through 13 months postsurgery	Began termination of project. Reinforced availability of community resources.	Self-concept, interdependence
	Provided positive reinforcement with progress made regarding resolution of fear related to recurrence and continued to normalize these feelings.	Self-concept
	Reviewed and reinforced the need for continued medical follow-up and continued use of the strategies and techniques learned.	Self-concept, interdependence

coefficient at baseline measurement was 0.93 in this study for the Arkansas and New Jersey samples.

The **Visual Analogue Scale–Worry (VAS-W)** measures cancer-related worry and was constructed by the investigators in this study according to Gift's (1989) instructions on determining the frequency and intensity of worry, or feelings of concern, about breast cancer. The VAS-W consists of two vertical 100 millimeter lines, each representing one dimension (i.e., frequency or intensity) of breast cancer-related worry that are anchored at each end with a descriptive phrase (i.e., "never worry at all" and "worry constantly"). Subjects marked a point on the line that indicated the frequency or intensity of breast cancer-related worry they had experienced during the previous week. The VAS-W is scored by measuring the length (in mil-

limeters) from the lowest end of the line to the subject's mark. The two VAS-W scores are totaled and can range from 0 (i.e., lowest frequency and intensity) to 200 (i.e., highest frequency and intensity).

The **Relationship Change Scale (RCS)** (Guernsey, 1977) measures a person's perception of changes in a relationship with a significant other with regard to satisfaction, communication, trust, sensitivity, openness, and understanding. The RCS initially was developed as a 27-item questionnaire; however, the investigators omitted two items related to sexual relationships and intimacy because, in this study, "significant other" could refer to someone other than a woman's partner or spouse. This minor adaptation made the tool appropriate to use in evaluating relationship changes between two people

who may not be sexually intimate. Each item is rated on a five-point scale ranging from -2 (much less) to +2 (much more). Scores for the 25-item RCS range from -50 (much less) to +50 (much more), with scores below zero indicating negative changes and scores above zero indicating positive changes in the relationship. Subjects assessed their relationships with their significant others since their breast cancer diagnosis. Subjects who did not feel close to another person did not complete the RCS. Construct validity of the RCS is supported by findings that more positive changes in the quality of the relationship occurred for couples who received relationship improvement training than those in control groups (Rappaport, 1976). A Cronbach's alpha internal consistency reliability coefficient of 0.95 was established for a sample of 181 women with breast cancer (Samarel, Fawcett, & Tulman, 1997). Cronbach's alphas at baseline were 0.95 and 0.97 for the New Jersey and Arkansas samples, respectively.

The 20-item **University of California, Los Angeles, Loneliness Scale-Version 3 (UCLA-3)** (Russell, 1982) was used to measure feelings of loneliness. Women rated their experiences during the previous week for each item on a four-point Likert-type scale ranging from 1 (never) to 4 (always). The total UCLA-3 score, which could range from 20-80, is the unweighted sum of all 20 items, with higher scores indicating greater degrees of loneliness. Cronbach's alpha for the UCLA-3 has been reported at 0.87 (Oshagan & Allen, 1992). Cronbach's alpha coefficients at baseline were 0.93 for the New Jersey sample and 0.92 for the Arkansas sample.

Samarel et al. (1996) modified the original Symptom Distress Scale developed by McCorkle and Young (1978) by adding items to measure the frequency, intensity, and distress associated with eight symptoms relevant to breast cancer to form the **Symptom Experience Scale (SES)**. Each of the resulting 24 items of the SES is rated on a five-point Likert scale ranging from 0 (absence of the symptom) to 4 (greatest frequency, intensity, or distress). Descriptive words operationalize each point on the scale. Item scores are summed to obtain three subscale scores (i.e., frequency, intensity, and distress), each with a possible range of 0-32; the higher the subscale score, the greater the total frequency, intensity, or distress. Total symptom experience is the sum of the three subscale scores, a value ranging from 0-96; the higher the score, the greater the total negative symptom experience. The SES was tested with a sample of 252 women with breast cancer. Exploratory factor analysis yielded six factors (i.e., nausea and appetite, fatigue and sleep, concentration, appearance, bowel pattern, and pain) that used all 24 SES items and accounted for 83.2% of the variance. Cronbach's alpha internal consistency reliability coefficients ranged from 0.92-0.96; the alpha for the total SES was 0.94. Subscale-to-subscale correlations ranged from 0.21-0.56 (Samarel et al., 1996). Subjects completed the SES by circling the number corresponding to their experience with each symptom during the previous week. Cronbach's alpha was 0.95 for the Arkansas sample. In addition to these questionnaires for measuring outcomes, background data sheets provided demographic health status information about the sample.

Results

A total of 106 women participated in the study at the Arkansas site (see Table 2). No significant demographic

Table 2. Demographics of the Arkansas Sample

Characteristic	Experimental Group (n = 54)		Control Group (n = 52)	
	n	%	n	%
X̄ age (years)				
Experimental group = 57	—	—	—	—
Control group = 58	—	—	—	—
Race				
Caucasian	42	78	45	87
African American	11	20	7	13
Native American	1	2	—	—
Annual household income (\$)				
Less than 10,000	7	13	4	8
10,000-20,000	10	19	10	19
20,001-30,000	10	19	10	19
30,001-40,000	8	15	7	13
40,001-50,000	4	7	6	12
More than 50,000	15	28	15	29
Employment status				
Homemaker	10	19	16	31
Retired	16	30	11	21
Employed	22	41	19	37
Unemployed because of illness	5	9	4	8
Unemployed for other reasons	1	2	2	4
Marital status				
Married or in partnered relationship	35	65	36	69
Never married	2	4	3	6
Separated	—	—	1	2
Divorced	12	22	8	15
Widowed	5	9	4	8
Breast cancer tumor-node-metastases stage				
0 (in situ)	6	11	3	6
I	11	20	22	42
II	22	41	11	21
III	9	17	6	12
Missing data	6	11	10	19
Type of surgery				
Lumpectomy	15	28	18	35
Mastectomy	39	72	33	63
None	—	—	1	2
Chemotherapy (phase II)				
Yes	31	57	16	31
No	22	41	33	63
Missing data	1	2	3	6
Radiation (phase II)				
Yes	3	6	3	6
No	50	93	46	88
Missing data	1	2	3	6
Hormonal therapy (phase II)				
Yes	6	11	13	25
No	47	87	36	69
Missing data	1	2	3	6

Note. Because of rounding, not all percentages total 100.

differences existed between the Arkansas study groups. The women in the experimental group were more likely to have a TNM stage II tumor, whereas women in the control group were more likely to have a TNM stage I tumor ($\chi^2 = 8.7$, $p = 0.03$). During the course of the study, the incidence of radiation or chemotherapy treatment did not differ between the two groups, except at the end of phase

II, when a greater proportion of women in the experimental group were receiving chemotherapy ($\chi^2 = 6.9$, $p = 0.008$), which may be explained by the initial group difference in tumor staging.

No statistically significant group differences were found for the outcome variables at baseline. The means and standard deviations for the outcome variables at baseline and at the completion of phases I, II, and III are presented in Table 3.

T tests were used to evaluate the differences in outcome measures between the two groups at the Arkansas site and to test the hypothesis that the group receiving the experimental treatment (i.e., 13 months of ongoing telephone social support and education using a one-time mailing of a resource kit) would have less mood disturbance, less cancer-related worry, less symptom distress, better well-being, and a higher-quality relationship with significant others compared to the control group receiving education via the one-time mailing of a resource kit. No statistically significant differences in outcomes were found at the end of any phase of the study. Multivariate repeated measures for data collected at the end of each study phase yielded no significant overall group effect. However, both groups showed significant improvement over time in mood ($p = 0.001$), symptom experience ($p < 0.001$), and relationships with significant others ($p = 0.023$). Also, outcomes differences occurred between women who underwent lumpectomies versus those who had mastectomies. Specifically, women who had mastectomies experienced more symptoms at the end of phase II ($t = -2.1$, $p = 0.04$) and a greater positive change in their relationships with significant others at the end of phase III ($t = -2.2$, $p = 0.03$).

The second hypothesis, that African American women's responses would not differ from those of Caucasian women in Arkansas, could not be tested. Although the final sample of the study was representative of the ethnic distribution of African Americans in Arkansas, the researchers were not able to enroll a sufficient number of African American women to test this hypothesis despite concerted recruitment strategies.

The third hypothesis, that women from Arkansas and New Jersey would not differ in their responses, was tested by comparing data collected for this study with a data set from a previous study of women from New Jersey. The Arkansas sample did not differ in baseline demographic or outcome measures from

the New Jersey sample with the exception that, statistically, the Arkansas sample had a significantly lower mean education level ($\bar{X} = 13.31$, $SD = 2.16$) than the New Jersey sample ($\bar{X} = 14.21$, $SD = 2.47$) ($t = 2.72$, $df = 195$, $p = 0.007$) and more women in New Jersey reported household incomes greater than \$50,000 ($n = 47$) than in Arkansas ($n = 30$) ($\chi^2 = 14.67$, $p = 0.01$). The Arkansas sample also had a greater number of women with stage II or III tumors ($n = 48$) than the New Jersey sample ($n = 29$) ($\chi^2 = 8.42$, $p = 0.04$). A multivariate analysis of variance with repeated measures was used to test for regional and treatment group differences on outcome measures over time. The researchers determined that site-by-group-by-time significant interaction effects were uninterpretable: Depending on the time period, women responded differently to the interventions by site.

Discussion

The findings of this study did not support the hypothesis that the Arkansas experimental group receiving telephone support and education with the one-time mailing of educational materials would have less mood disturbance, less cancer-related worry, less symptom distress, better well-being, and higher-quality relationships with significant others over time than the group receiving the one-time mailing of educational materials.

The hypothesis that African American women would not differ in their responses from Caucasian women in Arkansas could not be tested because an insufficient number of African American women were enrolled. Although concerted efforts to recruit African American women yielded a sample that reflected the proportion of African Americans in Arkansas, the researchers were not able to achieve the oversampling necessary. In the future, additional strategies, such as studies limited to African American patients with breast cancer, will need to be instituted for researchers wishing to test this hypothesis. A randomized support group intervention targeted to African American women with breast cancer ($N = 73$) resulted in improved mood and psychological functioning among women with greater baseline distress or lower income (Taylor et al., 2003). Future research should address effective methods of enrolling women who have the greatest need for support programs (i.e., those with fewer financial and psychosocial resources).

Table 3. Outcome Variables at Data Collection Points for All Available Arkansas Subjects by Study Group^a

Outcome Variable	Experimental Group								Control Group									
	Baseline (n = 54)		Phase I (n = 54)		Phase II (n = 53)		Phase III (n = 44)		Baseline (n = 52)		Phase I (n = 52)		Phase II (n = 49)		Phase III (n = 50)		Possible Range	
	\bar{X}	SE	\bar{X}	SE	\bar{X}	SE	\bar{X}	SE	\bar{X}	SE	\bar{X}	SE	\bar{X}	SE	\bar{X}	SE		
Cancer-related worry	81	7	56	7	56	7	60	7	0–200	77	7	66	7	52	7	48		7
Well-being	27	1	26	1	27	1	26	1	0–60	27	1	27	1	26	1	25	1	0–60
Mood disturbance	27	5	22	5	29	5	16	4	–32 to +232	24	5	26	6	17	5	12	4	–32 to +232
Relationship quality	15	2	14	2	11	3	16	3	–50 to +50	11	3	12	2	12	3	14	3	–50 to +50
Loneliness	34	1	34	1	35	1	34	1	20–80	34	1	35	2	35	1	36	1	20–80
Symptom distress	25	2	22	2	22	2	16	2	0–96	21	2	23	3	18	2	13	2	0–96

^a 95% of questionnaires were completed.

SE—standard error

The hypothesis that predicted no differences in response between the women from Arkansas and New Jersey also was not supported. The women in Arkansas did not experience a statistically significant improvement in the study outcomes when they received telephone support and the educational booklet, whereas the women in New Jersey did when compared with the group that received only the mailed educational information. This may be a result of unique differences between the teams delivering the intervention. In New Jersey, the intervention team consisted of oncology nurses paired with oncology social workers. In Arkansas, the team was limited to oncology nurses only. Perhaps the interdisciplinary mix in New Jersey was a value-added benefit. Regional and cultural differences also may have influenced the type and intensity of social support available to women through family and friends. Although data were not obtained regarding women's social support networks, regional differences may have been present. Psychosocial interventions are effective in one region of the country and not in another, which underscores the principle that outcomes must be evaluated regionally before a program is adopted for use based on success elsewhere.

Limitations to this study included the lack of a "usual care" group with which to compare the effectiveness of both intervention methods (i.e., the educational booklet with and without telephone support). The inclusion of a usual care group would help to establish the effect of time on the reduction of symptoms. Data also were unavailable regarding other sources of support that women used. One possible explanation for the lack of statistical significance between the two interventions in Arkansas may be that women were receiving additional support from other sources, such as cancer support groups, church groups, and other women's organizations. In fact, one of the recruitment sites was the American Cancer Society's Reach to Recovery program, which is a kind of support group. A greater proportion of women in the experimental group received chemotherapy at the end of phase II, which may have had some effect. The women receiving chemotherapy could have received personal support from their nurse or physician on a more frequent basis than those who did not receive chemotherapy.

Controversy exists regarding the efficacy of peer-discussion support groups, education-based support groups, and

other forms of support following breast cancer diagnosis (Helgeson, Cohen, Schulz, & Yasko, 2000, 2001; Nosarti, Roberts, Crayford, McKenzie, & David, 2002; Roy & Andrews, 1991; Samarel et al., 1997). Helgeson et al. (2001) found that the benefits of an education intervention were maintained in 252 subjects over a three-year period of time but found no benefits of peer discussion with or without education. According to Sandgren and McCaul (2003), support provided by telephone does not affect mood disturbance or quality of life greatly, although women receiving cancer education via telephone reported greater perceived control than those who received standard care. A randomized clinical trial tested the hypothesis that a multicomponent biobehavioral intervention affects the incidence of and time to recurrence for women with regional breast cancer (Andersen et al., 2004). The intervention, designed to reduce stress, lower emotional distress, and improve quality of life, included social support. Preliminary analyses showed significant lowering of anxiety and improvements in perceived social support and immune responses in patients receiving an intervention ($p < 0.05$) (Andersen et al.). This literature supports the importance of providing education to women receiving treatment for breast cancer. Patients with cancer who call cancer information lines primarily seek information about cancer (Marcus et al., 2002), thus validating the importance of providing education to patients.

Overall, the mailed resource kit alone appeared to be as effective as the mailed resource kit and telephone social support provided by oncology nurses for women in Arkansas and may be the most efficient and cost-effective way to provide educational support to newly diagnosed patients with breast cancer in this region. Given the current nursing shortage, oncology nurses should focus on efforts that maximize positive patient outcomes.

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References

- Andersen, B.L., Farrar, W.B., Golden-Kreutz, D.M., Glaser, R., Emery, C.F., Crespin, T.R., et al. (2004). Psychological, behavioral, and immune changes after a psychological intervention: A clinical trial. *Journal of Clinical Oncology*, 22, 3570–3580.
- Ashbury, F.D., Cameron, C., Mercer, S.L., Fitch, M., & Nielsen, E. (1998). One-on-one peer support and quality of life for breast cancer patients. *Patient Education and Counseling*, 35(2), 89–100.
- Blume, E. (1993). Sex after chemo: A neglected issue. *Journal of the National Cancer Institute*, 85, 768–770.
- Brandt, B. (1996). Depression in women with breast cancer. In K.H. Dow (Ed.), *Contemporary issues in breast cancer* (pp. 107–120). Sudbury, MA: Jones and Bartlett.
- Gift, A.G. (1989). Visual analogue scales: Measurement of subjective phenomena. *Nursing Research*, 38, 286–288.
- Guerney, B.G. (1977). *Relationship enhancement: Skill-training programs for therapy, problem prevention, and enrichment*. San Francisco: Jossey-Bass.
- Helgeson, V.S., Cohen, S., Schulz, R., & Yasko, J. (2000). Group support interventions for women with breast cancer: Who benefits from what? *Health Psychology*, 19, 107–114.
- Helgeson, V.S., Cohen, S., Schulz, R., & Yasko, J. (2001). Long-term effects of educational and peer discussion group interventions on adjustment to breast cancer. *Health Psychology*, 20, 387–392.
- Kahn, D., & Steeves, R. (1993). Spiritual well-being: A review of the research literature. *Quality of Life: A Nursing Challenge*, 2, 60–64.
- Knobf, M.T. (1986). Physical and psychologic distress associated with adjuvant chemotherapy in women with breast cancer. *Journal of Clinical Oncology*, 4, 678–684.
- Longman, A.J., Braden, C.J., & Mishel, M.H. (1999). Side-effects burden, psychological adjustment, and life quality in women with breast cancer: Pattern of association over time. *Oncology Nursing Forum*, 26, 909–915.
- Marcus, A.C., Garrett, K.M., Kulchak-Rahm, A., Barnes, D., Dortch, W., & Juno, S. (2002). Telephone counseling in psychosocial oncology: A report from the Cancer Information and Counseling Line. *Patient Education and Counseling*, 46, 267–275.

- McCorkle, R., & Young, K. (1978). Development of a symptom distress scale. *Cancer Nursing, 1*, 373–378.
- McNair, D.M., Lorr, M., & Droppleman, L.F. (1971). *EDITS manual for the Profile of Mood States*. San Diego, CA: Educational and Industrial Testing Service.
- Nosarti, C., Roberts, J.V., Crayford, T., McKenzie, K., & David, A.S. (2002). Early psychological adjustment in breast cancer patients: A prospective study. *Journal of Psychosomatic Research, 53*, 1123–1130.
- Oshagan, H., & Allen, R.L. (1992). Three loneliness scales: An assessment of their measurement properties. *Journal of Personality Assessment, 59*, 380–409.
- Pillon, L.R., & Joannides, G. (1991). An 11-year evaluation of a Living With Cancer program. *Oncology Nursing Forum, 18*, 707–711.
- Rappaport, A.F. (1976). Conjugal relationship enhancement program. In D.H.L. Olson (Ed.), *Treating relationships* (pp. 41–66). Lake Mills, IA: Graphic Publishing.
- Rice, M.A., & Szopa, T.J. (1988). Group intervention for reinforcing self-worth following mastectomy. *Oncology Nursing Forum, 15*, 33–37.
- Roy, C., & Andrews, H.A. (1991). *The Roy Adaptation Model: The definitive statement*. Norwalk, CT: Appleton and Lange.
- Russell, D.W. (1982). The measurement of loneliness. In L.A. Peplau & D. Perlman (Eds.), *Loneliness: A sourcebook of current theory, research, and therapy* (pp. 81–104). New York: Wiley Interscience.
- Samarel, N., & Fawcett, J. (1992). Enhancing adaptation to breast cancer: The addition of coaching to support groups. *Oncology Nursing Forum, 19*, 591–596.
- Samarel, N., Fawcett, J., Krippendorf, K., Piacentino, J.C., Eliasof, B., Hughes, P., et al. (1998). Women's perceptions of group support and adaptation to breast cancer. *Journal of Advanced Nursing, 28*, 1259–1268.
- Samarel, N., Fawcett, J., & Tulman, L. (1997). Effect of support groups with coaching on adaptation to early stage breast cancer. *Research in Nursing and Health, 20*, 15–26.
- Samarel, N., Leddy, S.K., Greco, K., Cooley, M.E., Torres, S.C., Tulman, L., et al. (1996). Development and testing of the symptom experience scale. *Journal of Pain and Symptom Management, 12*, 221–228.
- Samarel, N., Tulman, L., & Fawcett, J. (2002). Effects of two types of social support and education on adaptation to early-stage breast cancer. *Research in Nursing and Health, 25*, 459–470.
- Sandgren, A.K., & McCaul, K.D. (2003). Short-term effects of telephone therapy for breast cancer patients. *Health Psychology, 22*, 310–315.
- Sandgren, A.K., McCaul, K.D., King, B., O'Donnell, S., & Foreman, G. (2000). Telephone therapy for patients with breast cancer. *Oncology Nursing Forum, 27*, 683–688.
- Sparks, T.F. (1988). Coping with the psychosocial stresses of oncology care. *Journal of Psychosocial Oncology, 6*, 165–179.
- Spiegel, D., Bloom, J.R., & Yalom, I. (1981). Group support for patients with metastatic cancer. A randomized outcome study. *Archives of General Psychiatry, 38*, 527–533.
- Sutherland, H.J., Lockwood, G.A., & Cunningham, A.J. (1989). A simple, rapid method for assessing psychological distress in cancer patients: Evidence of validity for linear analog scales. *Journal of Psychosocial Oncology, 7*, 31–43.
- Taylor, K.L., Lamdan, R.M., Siegel, J.E., Shelby, R., Moran-Klimi, K., & Hrywna, M. (2003). Psychological adjustment among African American breast cancer patients: One-year follow-up results of a randomized psycho-educational group intervention. *Health Psychology, 22*, 316–323.
- Taylor, S.E., Lichtman, R.R., & Wood, J.V. (1984). Attributions, beliefs about control, and adjustment to breast cancer. *Journal of Personality and Social Psychology, 46*, 489–502.
- Taylor, S.E., Lichtman, R.R., Wood, J.V., Bluming, A.Z., Dosik, G.M., & Leibowitz, R.L. (1985). Illness-related and treatment-related factors in psychological adjustment to breast cancer. *Cancer, 55*, 2506–2513.
- Ward, J.A., Baum, S., Ter Maat, J., Thomsen, C.A., & Maibach, E.W. (1998). The value and impact of the Cancer Information Service telephone service. Part 4. *Journal of Health Communication, 3*(Suppl.), 50–70.
- Ward, S.E., Viergutz, G., Tormey, D., deMuth, J., & Paulen, A. (1992). Patients' reactions to completion of adjuvant breast cancer therapy. *Nursing Research, 41*, 362–366.
- Wolberg, W.H., Romsaas, E.P., Tanner, M.A., & Malec, J.F. (1989). Psychosexual adaptation to breast cancer surgery. *Cancer, 63*, 1645–1655. 